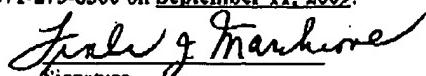


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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants : Alexander Köppel et al.
Application Number : 10/551,676
Filed : September 29, 2005
Title : PREPARATION OF POLYOLEFINS HAVING HIGH MOLECULAR WEIGHTS IN THE PRESENCE OF AN ORGANIC TRANSITION METAL COMPOUND IN A GAS-PHASE FLUIDIZED-BED REACTOR
Group Art Unit : 1796
Examiner : Robert D. Harlan
Docket No. : LU 6096 (US)

Mail Stop: Appeal Brief—Patents
Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest is Basell Polyolefine GmbH.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, their representatives, or their assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

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III. STATUS OF CLAIMS

Claims 1, 2, 4-9, 11 and 12 are on appeal. Claims 3 and 10 were canceled during prosecution.

IV. STATUS OF AMENDMENTS

Claims 1, 2, 4-9, 11, and 12 were amended and claims 3 and 10 were canceled during prosecution. All claim amendments have been considered and entered by the Examiner. No claim amendments are made in this Appeal Brief.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 is an independent claim and claims 2, 4-9, 11, and 12 depend from claim 1. Claim 1 claims an olefin polymerization process which comprises: (a) starting up the polymerization reaction in a gas-phase fluidized-bed reactor using a catalyst comprising a metallocene to produce a start-up polyolefin having a melt flow rate greater than 4.5 g/10 min (Specification page 2, line 16 to page 3, line 14); and (b) continuing the polymerization reaction and gradually decreasing the melt flow rate of the polyolefin to less than 4 g/10 min, wherein the melt flow rate is measured at 2.16 kg and 190°C in accordance with ISO 1133 (Specification, page 3, line 16 to page 6, line 3).

Unlike Ziegler-Natta catalysts which usually do not present start-up problems in olefin polymerization, metallocene catalysts present considerable start-up problems. Many metallocene catalysts, particularly for bis(1-methyl-3-butylcyclopentadienyl)zirconium dichloride, tend to form fine particles during the start-up of polymerization. The fine particles accumulate in the calming zone, form deposits and lumps, and hinder the start-up process to such an extent that the polymerization process may have to be terminated. (Specification, page 1, lines 20-30.) The process of the invention provides a specific solution to the start-up problem associated with the use of metallocene catalysts. That is, the process of the invention starts up the polymerization with a metallocene catalyst by producing a start-up polyolefin having a melt flow rate greater than 4.5 g/10 min and then continues the polymerization by producing a polyolefin having a

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melt flow rate less than 4.5 g/10 min. See claim 1. The claimed process has successfully reduced or eliminated the formation of lumps during the start-up step. See Example 1, page 33.

VI. GROUNDS OF REJECTIONS TO BE REVIEWED ON APPEAL

(a) Rejection of claims 1, 2, 4-9 and 12 under 35 U.S.C. §102 (b) as being anticipated by Herzog (US 6,265,502).

(b) Rejection of claim 11 under 35 U.S.C. §103(a) as being obvious over Herzog in view of Coalter et al., U.S. 2006/0142152 A1 (hereinafter "Coalter").

VII. ARGUMENTS

(a) **Rejection of claims 1, 2, 4-9, and 12 under 35 U.S.C. § 102 (b) as being anticipated by Herzog (US 6,265,502)**

MPEP § 2131 provides: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). According to MPEP § 2131.02, "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Herzog cannot anticipate claim 1 and its dependent claims 2, 4-9 and 12 because it does not teach "the identical invention . . . in as complete details as is contained in the . . . claim."

As indicated by claim 1, the process of the invention comprises two steps: a start-up step and a continued step. In the start-up step (a), a polyolefin having a melt flow rate greater than 4.5 g/10 min is made with a metallocene catalyst. In the continued step (b), the polymerization is continued by gradually decreasing the melt flow rate of the polyolefin to less than 4 g/10 min. The

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Examiner has failed to find the "identical invention" from Herzog. First, Herzog does not deal with the particular start-up problem associated with metallocene catalysts. The catalysts, which can be used in the start-up process of Herzog, are essentially all Ziegler-Natta type catalysts. See the Abstract, the Summary of the Invention on col. 1, lines 35-49, and the Description of the Invention on col. 5, lines 16-24, and in the Example on col. 6, starting from line 49. Although Herzog states on col. 5, lines 24-25 that it is also possible to use a metallocene-based catalyst in its process, Herzog views metallocene catalysts, at best, as an equivalent to Ziegler-Natta catalysts. Reading Herzog as a whole, it is fair to say that Herzog does not recognize, teach, or suggest the start-up problem associated with metallocene catalysts which Appellants deal with in this invention. More particularly, Herzog does not specifically teaches a process comprising two steps: in start-up step (a), a polyolefin having a melt flow rate greater than 4.5 g/10 min is made and in continued step (b), the polymerization is continued by gradually decreasing the melt flow rate of the polyolefin to less than 4 g/10 min.

Therefore, Herzog cannot anticipate claims 1, 2, 4-9, and 12 under MPEP § 2131 because it does not teach the identical invention as what Appellants claim.

(B) Rejection of claim 11 under 35 U.S.C. §103(a) as being obvious over Herzog in view of U.S. 2006/0142152 A1 (Coalter).

The Examiner's obviousness rejection of claim 11 is defective because claim 11 depends from claim 1 and the Examiner has never rejected claim 1 under 35 U.S.C. §103(a) as being obvious over Herzog in view of Coalter. If claim 1 is not obvious then claim 11 also cannot be obvious because it depends from a nonobvious claim. *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious."). The Examiner's obviousness rejection of claim 11 is defective also because regardless of the permissible level of flexibility in an

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obviousness inquiry, the burden of establishing a *prima facie* case of obviousness during prosecution still remains squarely with the examiner. According to MPEP §§ 2142 and 2143, an examiner seeking to establish a *prima facie* case of obviousness must clearly articulate reasons with rational, factual underpinnings to support the conclusion of obviousness. Here the Examiner has failed to support the obviousness rejection with rational, factual underpinnings. The Examiner simply stated that although "Herzog differs from the present invention in that the present invention requires a metallocene of bisindenylzirconium dichloride," Coalter teaches the use bisindenylzirconium dichloride in "analogous art a start-up polymerization." See page 4 of the Final Office Action. The Examiner merely identified claim elements scattered among references but did not clearly articulate reasons why the claimed invention logically follows from the teachings of the cited art. Under MPEP § 2142, the Examiner's such conclusory statements are insufficient to establish a *prima facie* case of obviousness.

While the Examiner has failed to clearly articulate reasons with rational, factual underpinnings to support the conclusion of obviousness, Appellants will analyze in great detail why claim 11 cannot be obvious over Herzog in view of Coalter.

First, Appellants will analyze why claim 1 cannot be obvious over Herzog in view of Coalter. As discussed in above subsection (a), Herzog as a whole does not recognize, teach, or suggest the start-up problem associated with metallocene catalysts and thus it cannot provide any solutions therefore. More particularly, Herzog does not teach a process comprising two steps: in the start-up step (a), a polyolefin having a melt flow rate greater than 4.5 g/10 min is made and in the continued step (b), the polymerization is continued by gradually decreasing the melt flow rate of the polyolefin to less than 4 g/10 min.

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Then the question is whether *Coalter* can remedy the deficiency of *Herzog* so that the combination of *Herzog* and *Coalter* can make the invention obvious. Appellants' answer to the question is "No."

Appellants do not dispute with the Examiner's assertion that *Coalter* discloses metallocene catalysts and recognizes the start-up problem associated with the catalysts. See page 15, paragraph [0257]. However, *Coalter* does not teach or suggest solving the start-up problem by a two-step process as defined by Appellants' claim 1. Instead, *Coalter*'s solution to the start-up problem is that "a polymerization catalyst and hydroxycarboxylate metal salt mixture is used on start-up to reduce or eliminate start-up problems." See page 15, paragraph [0257]. By comparing *Coalter* with Appellants' invention, one will see that the cited reference and the invention provide two completely different solutions to the start-up problem. *Coalter* thus fails to provide necessary remedies to the deficiency of *Herzog*, and therefore the combination of *Herzog* and *Coalter* cannot make claim 1 obvious.

Nor do Appellants dispute with the Examiner's assertion that *Coalter* discloses bisindenylzirconium dichloride which is a part of claim 11. However, as discussed above, claim 11 depends from claim 1 and thus for the same reason as claim 1, claim 11 cannot be obvious over *Herzog* in view of *Coalter*.

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In view of the above arguments, Appellants respectfully request that the Honorable Board of Appeals reverse the Examiner's above rejections and allow Appellants' claims 1, 2, 4-9, 11, and 12.

Respectfully submitted,
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Enclosures: Appendices VIII-X

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VIII. CLAIMS APPENDIX

1. A process for an olefin polymerization comprising (a) starting up the polymerization reaction in a gas-phase fluidized-bed reactor using a catalyst comprising a metallocene to produce a start-up polyolefin having a melt flow rate greater than 4.5 g/10 min; and (b) continuing the polymerization reaction and gradually decreasing the melt flow rate of the polyolefin to less than 4 g/10 min, wherein the melt flow rate is measured at 2.16 kg and 190°C in accordance with ISO 1133, and wherein said start-up phase of step (a) has a duration of 30 minutes to 30 hours.

2. The process of claim 1, wherein the start-up phase of step (a) has a duration of 2 hours to 20 hours.

3. (Canceled).

4. The process of claim 1, wherein the reaction temperature in step (a) is at least 1°C higher than the reaction temperature in step (b).

5. The process of claim 4, wherein the reaction temperature in step (a) is 1.5 to 4°C higher than the reaction temperature in step (b).

6. The process as claimed in claim 4, wherein the reaction temperature in step (b) is in a range bounded by an upper limit given by equation I

$$T_{RH} = 170 + \frac{6d'}{0.84 - d'} \quad (I)$$

and a lower limit given by equation II

$$T_{RN} = 173 + \frac{7.3d'}{0.837 - d'} \quad (II)$$

wherein,

T_{RH} is a maximum reaction temperature in °C

T_{RN} is a minimum reaction temperature in °C

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- d' is a value of a density of the polymer to be produced.
7. The process of claim 1, wherein the melt flow rate is regulated by hydrogen concentration in the reactor.
8. The process of claim 1, wherein the melt flow rate is regulated by a monomer partial pressure in the reactor.
9. The process of claim 1, wherein the polyolefin is a homopolymer or copolymer of ethylene.
10. (Canceled).
11. The process as claimed in claim 1, wherein the metallocene is selected from bis(1-methyl-3-butylcyclopentadienyl)zirconium dichloride or bisindenylzirconium dichloride.
12. The process of claim 1, wherein an alkylalumininoxane is used as an activating compound.

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IX. EVIDENCE APPENDIX

None

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X. RELATED PROCEDURE APPENDIX

None